

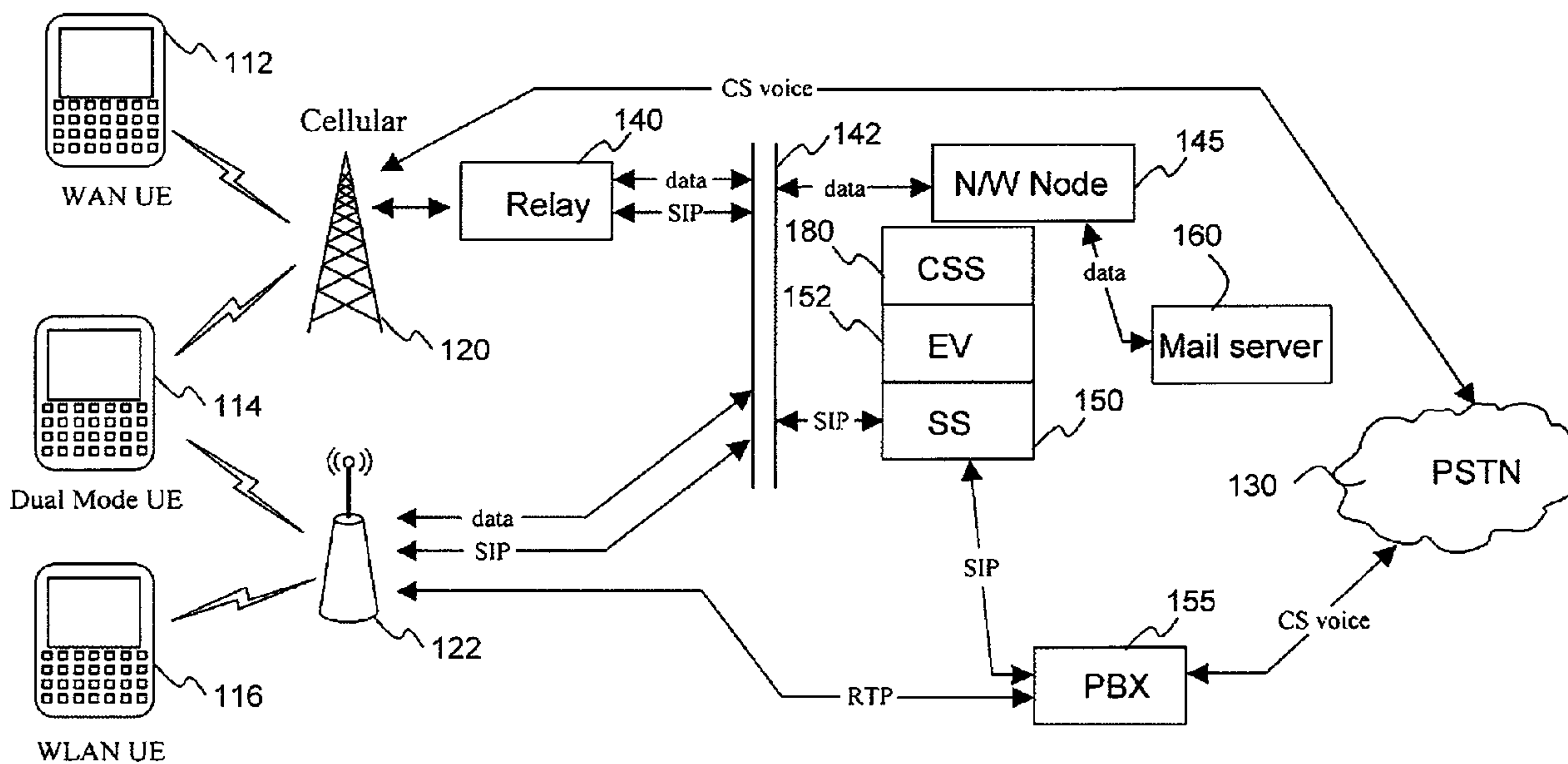


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(54) Titre : PROCÉDE ET SYSTEME POUR LA COLLECTE DE STATISTIQUES DE COMMUNICATION VOCALE POUR UN APPAREIL MOBILE

(54) Title: METHOD AND SYSTEM FOR THE COLLECTION OF VOICE CALL STATISTICS FOR A MOBILE DEVICE



(57) Abrégé/Abstract:

A method and system for collecting and tracking statistics of a mobile device having the steps of: adding a call statistics server at an enterprise, the call statistics server adapted to receive call statistics information from one or more mobile devices or adapted to gather call statistics information directly through monitoring call setup, throughput and disconnection traffic; and providing call statistics information to a recipient. The mobile device can then obtain and display the call statistics.

## **ABSTRACT**

A method and system for collecting and tracking statistics of a mobile device having the steps of: adding a call statistics server at an enterprise, the call statistics server adapted to receive call statistics information from one or more mobile devices or adapted to gather call statistics information directly through monitoring call setup, throughput and disconnection traffic; and providing call statistics information to a recipient. The mobile device can then obtain and display the call statistics.

## **METHOD AND SYSTEM FOR THE COLLECTION OF VOICE CALL STATISTICS FOR A MOBILE DEVICE**

### **FIELD OF THE DISCLOSURE**

**[0001]** The present application relates to call statistics collection, and in particular, to the collection of call statistics information for a mobile device capable of transmitting voice and data.

### **BACKGROUND**

**[0002]** Mobile devices capable of transmitting voice and data are becoming increasingly common in the marketplace and are referred to as Smartphones, personal digital systems or other similar names. Examples include the Research in Motion Blackberry™, Palm Treo™, among others.

**[0003]** The capability of transmitting voice over a data connection is what is called "Voice Over Internet Protocol" (VoIP) and allows such devices to carry voice traffic over an Internet connection, bypassing the traditional circuit switched voice service offered over a wide area wireless networks.

**[0004]** Mobile devices are also becoming multi-mode, meaning that they can use multiple radio technologies such as Global System for Mobile communication (GSM), Code Division Multiple Access (CDMA), third generation (3G) and wireless fidelity (WiFi), among others, to transmit voice calls and data traffic. Using the data capability available on Smartphones, the user may wish to view historical data associated with calls made from his/her handset.

**[0005]** The collection of historical data or statistics for voice calls is essential to any telecommunications provider, as it is the basis for billing. But is also a tool that can be used for network configuration and planning as well as troubleshooting specific problems with specific handset makes or specific users. This information, if available to the user, could also aid the user in better

understanding how to use their mobile device in a more cost effective way, as well as providing information on how they have used the mobile device in the past.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

**[0006]** The present disclosure will be better understood with reference to the drawings in which:

**Figure 1** is a block diagram showing an architecture of an exemplary mobile device network;

**Figure 2** is a flow chart for a method of a mobile device to collect call statistics;

**Figure 3** is a block diagram of an exemplary mobile device for use in association with the present method and system;

**Figure 4** is a data flow diagram illustrating a call statistics server monitoring communications between a mobile device and a network; and

**Figure 5** is a data flow diagram illustrating a call statistics server receiving statistics reports from a mobile device.

## **DETAILED DESCRIPTION**

**[0007]** The advent of data capable mobile device allows an enterprise to provide a server to collect statistics that are reported to it from mobile devices using data connectivity available. These statistics can be viewed by corporate telecom management. The information allows a corporate information technology (IT) group to configure its network through a corporate IT policy, planning for future growth and troubleshooting voice calls.

**[0008]** With the mix of radio technologies available and used, corporate IT management needs information on network service interplay, such as hand-off between network services using different technologies. The collection of statistics in this new environment therefore becomes an important tool to help the

users and owners of multi-mode mobile devices to manage and control usage and costs.

**[0009]** The present disclosure provides a method for collecting and tracking statistics of a mobile device comprising the steps of: adding a statistics server at an enterprise, said statistics server adapted to receive call statistics information from one or more mobile devices or adapted to gather call statistics information directly through monitoring call set-up, throughput and disconnection traffic; and, providing call statistics information to a recipient.

**[0010]** The present disclosure further provides a method on a mobile device for maintaining a call statistics information repository comprising the steps of: after a call has ended, requesting statistics from a call statistics server; receiving the statistics from the call statistics server; and updating the repository with the received statistics.

**[0011]** The present disclosure further provides a mobile device adapted to show call history, comprising: a communications subsystem adapted to communicate with one or more networks and further adapted to communicate with a call statistics server; a repository, the repository adapted to store call statistics received from the call statistics server; and a user interface, said user interface comprising a display for selectively showing call history on the mobile device.

**[0012]** The present disclosure further provides a call statistics server located within an enterprise, the call statistics server comprising: a processor adapted to monitor call setup, throughput and disconnection traffic of one or more mobile devices and/or to receive call statistics from the one or more mobile devices; and storage, said storage adapted to store statistics found or received by the processor, wherein said call statistics server is adapted to provide stored statistics to a recipient.

**[0013]** The present disclosure further provides a system for collecting and providing call statistics information to a mobile device comprising: a call statistics server, said call statistics server having: a processor adapted to monitor call setup, throughput and disconnection traffic of one or more mobile devices or to receive call statistics from the one or more mobile devices; and storage, said storage adapted to store statistics found or received by the processor; and one or more mobile devices, each of said one or more mobile devices having: a communications subsystem adapted to communicate with one or more networks and further adapted to communicate with the call statistics server; a repository, the repository adapted to store call statistics received from the call statistics server; and a user interface, said user interface comprising a display for selectively showing call history on the mobile device.

**[0014]** Reference is now made to **Figure 1**. **Figure 1** illustrates an architectural overview for voice and data. Three mobile devices, **112**, **114** and **116** are illustrated.

**[0015]** Mobile device **112** is a single mode wide area network mobile device (WAN) which communicates with a cellular network **120**.

**[0016]** Mobile device **116** is a single mode wireless local area network (WLAN) mobile device which communicates with the data access point **122**.

**[0017]** Mobile device **114** is a dual mode mobile device which communicates both with the cellular network **120** and the data access point **122**.

**[0018]** The present disclosure will use mobile device **114**, which is a dual mode mobile device, for illustration purposes.

**[0019]** Mobile device **114** may connect through cellular network **120** to provide either voice or data services. As will be appreciated, various cellular networks

exist including, but not limited to, GSM, General Packet Radio Service (GPRS), CDMA, Universal Mobile Telecommunications System (UMTS), Wideband Code Division Multiple Access (WCDMA), among others. These technologies allow the use of voice, data or both at one time.

**[0020]** A circuit switched call, as seen from **Figure 1**, will proceed through a circuit switched voice channel to public switched telephone network **130**.

**[0021]** Data proceeds through a relay **140**, preferably through a firewall **142** to one of several servers servicing the data call.

**[0022]** As is seen in **Figure 1**, data proceeds through the firewall **142** to a network node **145** and potentially out to a Mail Server **160**, depending on the nature of the data.

**[0023]** If the call is a transmission of voice over a data connection using VoIP, the data proceeds over session initiation protocol (SIP) to a SIP server **150**.

**[0024]** From SIP server **150**, the VoIP call proceeds over a private branch exchange (PBX) **155** and then becomes a circuit-switched voice call over Public Switched Telephone Network (PSTN) **130**.

**[0025]** Mobile device **114** can further communicate over a data access point for a wireless local area network (WLAN). Examples of WLAN technologies include Wireless Fidelity (WiFi) or Worldwide Interoperability for Microwave Access (WiMax) as underlying technologies of wireless local area networks.

**[0026]** As with the cellular connection, data and VoIP calls can be routed through a firewall **142** to either the network node **145** or to SIP server **150**. The VoIP call then would proceed again through PBX **155** to PSTN **130**.

**[0027]** Alternatively, the VoIP call can be routed through a real time transport protocol (RTP) directly to the private branch exchange **155**, at which point it is converted to a circuit switched call and routed through the public switched telephone network (PSTN) **130**.

**[0028]** An Enterprise Voice Server **152** could be included for various functionality including monitoring voice calls, providing call statistics, call costs, policy usage, among others.

**[0029]** For a handheld mobile device user, access to call statistics can be very helpful to know, for example, how many calls were made to a specific number or person in the last month, and how many minutes did these calls last. This can be used to verify charges for certain types of calls that are billable, such as calls to a solicitor. Other information, such as calls made over a specific network, provider or technology; calls from a specific geographic location; calls that were handed over across network services; calls unanswered; missed incoming calls; and calls made while outside the home network (roaming) are a few examples.

**[0030]** Also, call history could be integrated with a customer relationship management system where the handheld user can request further information about a specific call. For example, if a salesman takes notes about a conversation, those notes could be reviewed before a follow-up call is made. Call tracking can be very complicated for sales personnel, and such a tool would greatly assist them in managing their time.

**[0031]** Presenting call history information in a user friendly format on a mobile device display can be an invaluable tool for mobile workers.

**[0032]** In a further embodiment, a corporate IT group can also access all of the above listed information and may generate statistic reports for a group of users or makes of handsets and also specific voice call patterns. If a number of users



complain of dropped calls on a specific network provider in a specific location, the voice call statistics could provide evidence of that behavior, which can then be reported back to the carrier in question. Significant numbers of examples exist where call statistics access will be helpful in managing corporate IT voice call costs.

**[0033]** Referring again to **Figure 1**, a call statistics server **180** is located within an enterprise. As will be appreciated by those skilled in the art, call statistics server **180** may be part of a network node **145** or can be a separate server communicating with the network node **145**.

**[0034]** Call statistics server **180** can receive call statistic information from handheld mobile devices or gather these statistics directly through the monitoring of voice call set-up, throughput and disconnection traffic, and hold this information for use by corporate IT and handheld users.

**[0035]** Reference is now made to **Figure 4**. **Figure 4** shows a data flow diagram in which a call statistics server **410** monitors communications between a mobile device **420** and a network **430**. As will be appreciated by those skilled in the art network **430** could be any network that a mobile device communicates with, and reference is made, for example, to **Figure 1** to show exemplary networks.

**[0036]** Mobile device **420** sends various messages to network **430**. These include a call set up message **442**, data and/or voice throughput message **444** and call disconnection message **446**, among others. In the embodiment of **Figure 4** call statistics server **410** monitors messages **442**, **444** and **446** to compile call statistics for mobile device **420**. These statistics can then be stored on call statistics server **410** and provided to a mobile device **420** or to a corporate information technology department as required.

**[0037]** Alternatively, a call statistic server could receive the statistics directly from a mobile device. Reference is now made to **Figure 5**.

**[0038]** In the embodiment of **Figure 5** a call statistics server **510** collects statistics from a mobile device **520**. Mobile device **520** communicates with a network **530**. Message traffic between mobile device **520** and network **530** could include, for example, a call set up message **542**, data and/or voice throughput **544** and call disconnection message **546**.

**[0039]** In the embodiment of **Figure 5**, once a mobile device **520** sends a call disconnection message **546**, or the call is disconnected for any other reason, a reporting message **550** is sent to a call statistics server **510**. Such a reporting message **550** could include the duration of the call, data throughput, network used, networks the call was transferred to and the time of the transfer, and destination phone number, among others. Call statistics server can then compile call statistics for mobile device **520** based on the received reporting messages **550**.

**[0040]** Alternatively, a reporting message **550** could be sent after each of the stages illustrated by messages **542**, **544** and **546**. In particular, a reporting message could be sent after the call setup, periodic reporting messages could be sent to indicate call throughput and a message could be sent at call disconnection. In this case, call statistics server **510** would compile the various reporting messages to produce call statistics for mobile device **520**.

**[0041]** Once call statistics are compiled, they are in many cases useful to the user of a mobile device. Reference is now made to **Figure 2**. **Figure 2** shows a flow chart illustrating a method for a mobile device to obtain call statistics. As will be appreciated by those skilled in the art, **Figure 2** is merely one method of obtaining call statistics and other methods are possible. In particular, call

statistics can either be stored on the mobile device or, if a user is accessing call statistics information, it can be obtained from the network at that time.

**[0042]** If the call statistics are being kept on the mobile device, the call statistics can be updated periodically, for example, once a day, once an hour or after each call has been made. **Figure 2** shows the last option, but is not meant to limit the present disclosure.

**[0043]** Referring to **Figure 2**, the process starts at step **210**. The process then proceeds to step **212** in which the mobile device places a call. Step **214** monitors whether the call has ended.

**[0044]** Once the call has ended, the process proceeds to step **216** in which the statistics are requested from the statistics server (for example, call statistics server **180** from **Figure 1**).

**[0045]** The process proceeds to step **218** in which it receives the statistics from the statistic server **180** and updates the storage of the statistics on the mobile device. As will be appreciated, step **218** allows the updating of locally stored call statistics by the mobile device by only receiving call statistics for the call that has just ended. This allows the mobile device to maintain an up-to-date database and limits the amount of data that needs to be sent over the air each time a statistics storage on the mobile device is updated.

**[0046]** Once the mobile device has call statistics, a user interface to display the cost statistics can be presented. This interface aids the user in better understanding how to use their handheld device in a more cost effective way. The user interface on a mobile device can, in one embodiment, exploit a high quality display to show call history. The call history may be viewed from a number of historical perspectives such as:

- number of calls made from mobile device, duration, time, and date and cost of each call;
- total number of minutes, total costs;
- calls made to a specific number showing time, date, duration and cost;
- all of the above showing calls made using a specific network service;
- all of the above showing calls handed over across network services.

**[0047]** In one embodiment, dual mode devices such as mobile device **114** from **Figure 1** provide the option of showing the number of minutes of voice over a WiFi versus a circuit switched call. Further information can be provided about calls dropped from WiFi and reconnected on circuit switched networks; statistics on circuit switched call set-ups that are rerouted to WiFi; statistics on ongoing circuit switched calls automatically switched to WiFi.

**[0048]** The present statistics also can show calls that are rerouted to 800 service numbers as opposed to direct dial numbers. The process then proceeds to block **220** and ends.

**[0049]** As will be appreciated by those skilled in the art, the above therefore allows for the collection of statistics for different types of access technologies and can consolidate call history. Thus, whether the mobile uses VoIP over a WiFi network or a circuit switched call through a cellular network, the statistics can be corrected and consolidated. Further, by maintaining a separate dedicated server at the enterprise, both the user can benefit by being provided with up-to-date information in a high quality user interface and the enterprise information technology department can better make policy for the use of the handheld device.

**[0050]** As will be appreciated, the above can be implemented on any mobile device. One exemplary mobile device is described below with reference to **Figure 3**. This is not meant to be limiting, but is provided for illustrative purposes.

**[0051]** Figure 3 is a block diagram illustrating a mobile device apt to be used with preferred embodiments of the apparatus and method of the present application. Mobile device **300** is preferably a two-way wireless communication device having at least voice and data communication capabilities. Mobile device **300** preferably has the capability to communicate with other computer systems on the Internet. Depending on the exact functionality provided, the wireless device may be referred to as a data messaging device, a two-way pager, a wireless e-mail device, a cellular telephone with data messaging capabilities, a wireless Internet appliance, or a data communication device, as examples.

**[0052]** Where mobile device **300** is enabled for two-way communication, it will incorporate a communication subsystem **311**, including both a receiver **312** and a transmitter **314**, as well as associated components such as one or more, preferably embedded or internal, antenna elements **316** and **318**, local oscillators (LOs) **313**, and a processing module such as a digital signal processor (DSP) **320**. As will be apparent to those skilled in the field of communications, the particular design of the communication subsystem **311** will be dependent upon the communication network in which the device is intended to operate.

**[0053]** Network access requirements will also vary depending upon the type of network **319**. In some CDMA networks network access is associated with a subscriber or user of mobile device **300**. A CDMA mobile device may require a removable user identity module (RUIM) or a subscriber identity module (SIM) card in order to operate on a CDMA network. The SIM/RUIM interface **344** is normally similar to a card-slot into which a SIM/RUIM card can be inserted and ejected like a diskette or PCMCIA card. The SIM/RUIM card can have approximately 64K of memory and hold many key configuration **351**, and other information **353** such as identification, and subscriber related information.

**[0054]** When required network registration or activation procedures have been completed, mobile device **300** may send and receive communication signals over the network **319**. As illustrated in **Figure 3**, network **319** can consist of multiple base stations communicating with the mobile device. For example, in a hybrid CDMA 1x EVDO system, a CDMA base station and an EVDO base station communicate with the mobile device and the mobile device is connected to both simultaneously. The EVDO and CDMA 1x base stations use different paging slots to communicate with the mobile device.

**[0055]** Signals received by antenna **316** through communication network **319** are input to receiver **312**, which may perform such common receiver functions as signal amplification, frequency down conversion, filtering, channel selection and the like, and in the example system shown in **Figure 3**, analog to digital (A/D) conversion. A/D conversion of a received signal allows more complex communication functions such as demodulation and decoding to be performed in the DSP **320**. In a similar manner, signals to be transmitted are processed, including modulation and encoding for example, by DSP **320** and input to transmitter **314** for digital to analog conversion, frequency up conversion, filtering, amplification and transmission over the communication network **319** via antenna **318**. DSP **320** not only processes communication signals, but also provides for receiver and transmitter control. For example, the gains applied to communication signals in receiver **312** and transmitter **314** may be adaptively controlled through automatic gain control algorithms implemented in DSP **320**.

**[0056]** Mobile device **300** preferably includes a microprocessor **338** which controls the overall operation of the device. Communication functions, including at least data and voice communications, are performed through communication subsystem **311**. Microprocessor **338** also interacts with further device subsystems such as the display **322**, flash memory **324**, random access memory (RAM) **326**, auxiliary input/output (I/O) subsystems **328**, serial port **330**, one or more keyboards or keypads **332**, speaker **334**, microphone **336**, other

communication subsystem **340** such as a short-range communications subsystem and any other device subsystems generally designated as **342**. Serial port **330** could include a USB port or other port known to those in the art.

**[0057]** Some of the subsystems shown in **Figure 3** perform communication-related functions, whereas other subsystems may provide “resident” or on-device functions. Notably, some subsystems, such as keyboard **332** and display **322**, for example, may be used for both communication-related functions, such as entering a text message for transmission over a communication network, and device-resident functions such as a calculator or task list.

**[0058]** Operating system software used by the microprocessor **338** is preferably stored in a persistent store such as flash memory **324**, which may instead be a read-only memory (ROM) or similar storage element (not shown). Those skilled in the art will appreciate that the operating system, specific device applications, or parts thereof, may be temporarily loaded into a volatile memory such as RAM **326**. Received communication signals may also be stored in RAM **326**.

**[0059]** As shown, flash memory **324** can be segregated into different areas for both computer programs **358** and program data storage **350**, **352**, **354** and **356**. These different storage types indicate that each program can allocate a portion of flash memory **324** for their own data storage requirements. Microprocessor **338**, in addition to its operating system functions, preferably enables execution of software applications on the mobile device. A predetermined set of applications that control basic operations, including at least data and voice communication applications for example, will normally be installed on mobile device **300** during manufacturing. Other applications could be installed subsequently or dynamically.

**[0060]** A preferred software application may be a personal information manager (PIM) application having the ability to organize and manage data items relating to

the user of the mobile device such as, but not limited to, e-mail, calendar events, voice mails, appointments, and task items. Naturally, one or more memory stores would be available on the mobile device to facilitate storage of PIM data items. Such PIM application would preferably have the ability to send and receive data items, via the wireless network **319**. In a preferred embodiment, the PIM data items are seamlessly integrated, synchronized and updated, via the wireless network **319**, with the mobile device user's corresponding data items stored or associated with a host computer system. Further applications may also be loaded onto the mobile device **300** through the network **319**, an auxiliary I/O subsystem **328**, serial port **330**, short-range communications subsystem **340** or any other suitable subsystem **342**, and installed by a user in the RAM **326** or preferably a non-volatile store (not shown) for execution by the microprocessor **338**. Such flexibility in application installation increases the functionality of the device and may provide enhanced on-device functions, communication-related functions, or both. For example, secure communication applications may enable electronic commerce functions and other such financial transactions to be performed using the mobile device **300**.

**[0061]** In a data communication mode, a received signal such as a text message or web page download will be processed by the communication subsystem **311** and input to the microprocessor **338**, which preferably further processes the received signal for element attributes for output to the display **322**, or alternatively to an auxiliary I/O device **328**. A push client **360** could also process the input.

**[0062]** A user of mobile device **300** may also compose data items such as email messages for example, using the keyboard **332**, which is preferably a complete alphanumeric keyboard or telephone-type keypad, in conjunction with the display **322** and possibly an auxiliary I/O device **328**. Such composed items may then be transmitted over a communication network through the communication subsystem **311**.



**[0063]** For voice communications, overall operation of mobile device **300** is similar, except that received signals would preferably be output to a speaker **334** and signals for transmission would be generated by a microphone **336**. Alternative voice or audio I/O subsystems, such as a voice message recording subsystem, may also be implemented on mobile device **300**. Although voice or audio signal output is preferably accomplished primarily through the speaker **334**, display **322** may also be used to provide an indication of the identity of a calling party, the duration of a voice call, or other voice call related information for example.

**[0064]** Serial port **330** in **Figure 3** would normally be implemented in a personal digital assistant (PDA)-type mobile device for which synchronization with a user's desktop computer (not shown) may be desirable, but is an optional device component. Such a port **330** would enable a user to set preferences through an external device or software application and would extend the capabilities of mobile device **300** by providing for information or software downloads to mobile device **300** other than through a wireless communication network. The alternate download path may for example be used to load an encryption key onto the device through a direct and thus reliable and trusted connection to thereby enable secure device communication. As will be appreciated by those skilled in the art, serial port **330** can further be used to connect the mobile device to a computer to act as a modem.

**[0065]** Other communications subsystems **340**, such as a short-range communications subsystem, is a further optional component which may provide for communication between mobile device **300** and different systems or devices, which need not necessarily be similar devices. For example, the subsystem **340** may include an infrared device and associated circuits and components or a Bluetooth™ communication module to provide for communication with similarly

enabled systems and devices. Subsystem **340** may also be used for WiFi communications.

**[0066]** The embodiments described herein are examples of structures, systems or methods having elements corresponding to elements of the techniques of this application. This written description may enable those skilled in the art to make and use embodiments having alternative elements that likewise correspond to the elements of the techniques of this application. The intended scope of the techniques of this application thus includes other structures, systems or methods that do not differ from the techniques of this application as described herein, and further includes other structures, systems or methods with insubstantial differences from the techniques of this application as described herein.

**CLAIMS**

We claim:

1. A method on a multi-mode device for collecting and tracking call  
5 statistics of said mobile device that is adapted to communicate voice  
and data, with one or more networks having multiple radio  
technologies, said method comprising the steps of:  
reporting to a call statistics server one or more call reporting  
10 messages for each call for compilation at said call statistics server  
to produce call statistics, each of said call reporting messages  
including at least one of: duration of a call, data throughput,  
network used, networks the call was transferred to, time of the call  
transfer, and destination phone number;  
15 requesting call statistics from said call statistics server, said call  
statistics including at least one of: number of calls made to specific  
phone number, duration of calls, calls made using a specific  
network service, calls handed over across network services, calls  
received from a specific geographic location, missed incoming  
20 calls, calls made outside a home network, and calls rerouted to 800  
service numbers versus direct dial numbers; and  
updating a repository on said mobile device with said received call  
statistics.
2. The method of claim 1 wherein the mobile device provides a display to  
25 show call history, said call history being based on said call statistics  
stored in said repository and includes at least one of: number of calls  
made from said mobile device; duration, time date and cost of each  
call; total number of minutes and total costs made from said mobile  
device; calls made to a specific phone number; calls made using a  
30 specific network service; calls handed over across network services;  
and statistic enabling at least a comparison between voice service over

a packet-switched wireless local area network and voice service over a circuit-switched wide area wireless network.

3. The method of claim 1, wherein said requesting step comprises:

5 after a call has ended, requesting statistics from said call statistics server;  
receiving the statistics from the call statistics server.

4. The method of claim 3, wherein the received statistics only relate to the  
10 call that has ended.

5. The method of claim 2, wherein the call statistics further comprises at least one of: a number of minutes of voice over wireless local area network 'WLAN' as compared with a number of minutes of voice over a  
15 circuit switched network service; statistics for calls dropped from a WLAN and reconnected on a circuit switched network; information about circuit switched call set-ups that are re-routed to WLAN network services; and ongoing circuit switched calls automatically switched to WLAN network services.

20

6. A multi-mode mobile device capable of voice and data communication and adapted to show call history, comprising:

25 a communications subsystem adapted to communicate with one or more networks of multiple radio technologies, said communication subsystem further adapted to communicate call reporting messages to a call statistics server, each of said call reporting messages including at least one of: duration of call, data throughput, network used, networks the calls was transferred to, time of the call transfer, and designation phone number;

30

a repository, the repository adapted to store call statistics received from the call statistics server, said call statistics being compiled and

produced by said call statistics server from said call reporting messages, said call statistics including at least one of: number of calls made to a specific phone number, duration of calls, calls made using a specific network service, calls handed over across network services,  
 5 calls received from a specific geographic location, missed incoming calls, calls made outside a home network, and call rerouted to 800 service numbers versus direct dial numbers; and

a memory containing a program;

a processor arranged to execute said program for implementing the  
 10 method of claim 1; and

a user interface, said user interface comprising a display for selectively showing call history on the mobile device, wherein said call history is based on said stored call statistics.

15 7. A call statistics server located within an enterprise, the call statistics server comprising:

a processor adapted to receive call reporting messages from a multi-mode mobile device that is capable of voice and data communication with one or more networks of multiple radio technologies, and is further  
 20 adapted to compile and produce call statistics from said received reporting messages, and to communicate call statistics to said mobile device, each of said call reporting messages including at least one of: duration of a call, data throughput, network used, networks the call was transferred to, time of the call transfer, and destination phone number;

25 and a storage, said storage adapted to store said call statistics, said call statistics including at least one of: number of calls made to a specific phone number, duration of calls, calls made using a specific network service, calls handed over across network services, calls received from a specific geographic location, missed incoming calls,  
 30 calls made outside a home network, calls rerouted to 800 service numbers versus direct dial numbers, number of minutes of voice calls

over a packet-switched wireless local area network as compared with number of minutes of voice calls over a circuit switched wide area wireless network, statistics for calls dropped from a packet-switched wireless local area network and reconnected on a circuit-switched wide area wireless network, statistics on circuit-switched call set-ups that are re-routed to a packet-switched wireless local area network, and statistics on ongoing circuit-switched calls that are automatically switched to a packet-switched wireless local area network.

5  
10 8. A system for collecting and providing call statistics to a multi-mode mobile device that is adapted for voice and data communication with one or more networks of multiple radio technologies, said system comprising:

a) a call statistics server, said call statistics server having:

15 a processor adapted to receive call reporting messages from a multi-mode mobile device that is capable voice and data communication with one or more networks of multiple radio technologies, and is further adapted to compile and produce call statistics to said mobile device, each of said call reporting messages including at least one of: duration of a call, data throughput, network used, networks the call was transferred to, time of the call transfer, and destination phone number; and

20 storage, said storage adapted to store said call statistics, said call statistics including at least one of: number of calls made to a specific phone number, duration of calls, calls made using a specific network service, calls handed over across network services, call received from a specific geographic location, missed incoming calls, calls made outside a home network, calls rerouted to 800 service numbers versus direct dial numbers, number of minutes of voice calls over a packet-switched wireless local area network as compared with number of minutes of voice calls over a

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circuit-switched wide area wireless network, statistics for calls dropped from a packet-switched wireless local area network and reconnected on a circuit-switched wide area wireless network, statistics on circuit-switched call setups that are re-routed to a packet-switched wireless local area network, and statistic on ongoing circuit-switched calls that are automatically switched to a packet-switched wireless local area networks; and

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b) the mobile devices, having:

a communications subsystem adapted to communicate with one or more networks of multiple radio technologies and further adapted to communicate call reporting messages to the call statistics server, each of said call reporting messages including at least one of: duration of a call, data throughput, network used, networks the call was transferred to, time of the call transfer, and destination phone number;

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a repository, the repository adapted to store call statistics received from the call statistics server, said call statistics being compiled and produced by said call statistics server from said call reporting messages, said call statistics including at least one of: number of calls made to a specific phone number, duration of calls, calls made using a specific network service, calls handed over across network services, calls received from a specific geographic location, missed incoming calls, calls made outside a home network, and call rerouted to 800 service numbers versus direct dial numbers; and

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a user interface, said user interface comprising a display for selectively showing call history on the mobile device, wherein said call history is based on said stored call statistics;

a memory containing a program;

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a processor arranged to execute said program for implementing the method of claim 1.

9. The method of claim 1, wherein the mobile device is adapted to communicate voice and data with networks of multiple radio technologies that include at least voice service over a packet-switched wireless local area network and voice  
5 service over a circuit-switched wide area wireless network.

10. A method on a call statistics server for producing call statistics for a multi-mode mobile device that is adapted to communicate voice and data with one or more networks of multiple radio technologies, said method comprising the steps  
10 of:

receiving from said mobile device one or more call reporting messages for each call, each of said call reporting messages includes at least one of: duration of a call, data throughput, network used, networks the call was transferred to, time of the call transfer, and destination phone number;

15 compiling said call reporting messages to produce call statistics, said call statistics includes at least one of: number of calls made to a specific phone number, duration of calls, calls made using a specific network service, calls handed over across network services, calls received from a specific geographic location, missed incoming calls, calls made outside a home network, and calls  
20 rerouted to 800 service numbers versus direct dial numbers; and

storing said call statistics in a storage on said call statistics server.

11. The method of claim 10, wherein said call statistics further comprises at least one of: number of minutes of voice calls over a packet-switched wireless local  
25 area network as compared with number of minutes of voice calls over a circuit-switched wide area wireless network, statistics for calls dropped from a packet-switched wireless local area network and reconnected on a circuit-switched wide area wireless network, statistics on circuit-switched call set-ups that are re-routed to a packet-switched wireless local area network, and statistics on ongoing  
30 circuit-switched calls that are automatically switched to a packet-switched wireless local area network.



12. The method of claim 10 or 11, wherein said call statistics server sends call statistics to said mobile device when requested by said mobile device.

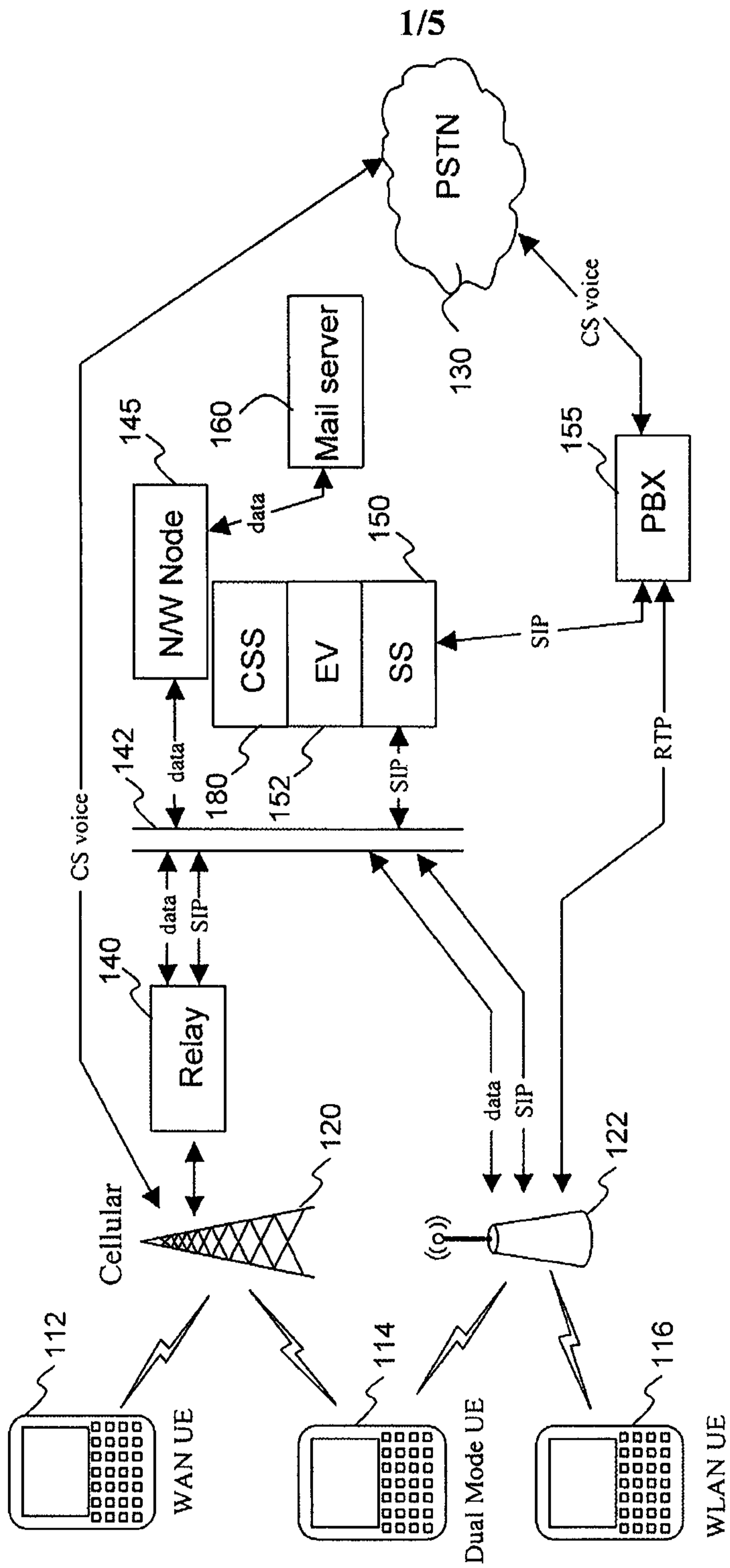
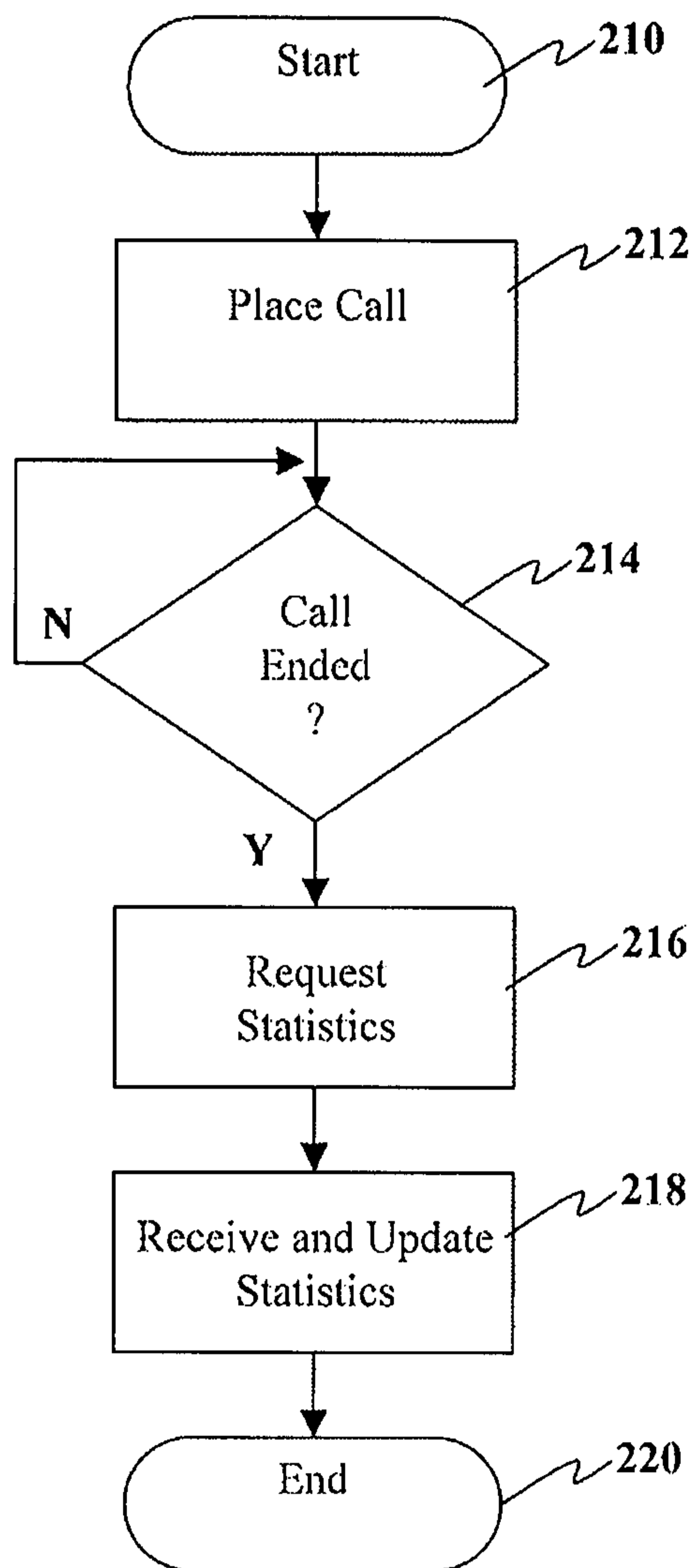


FIG. 1

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**Fig. 2**

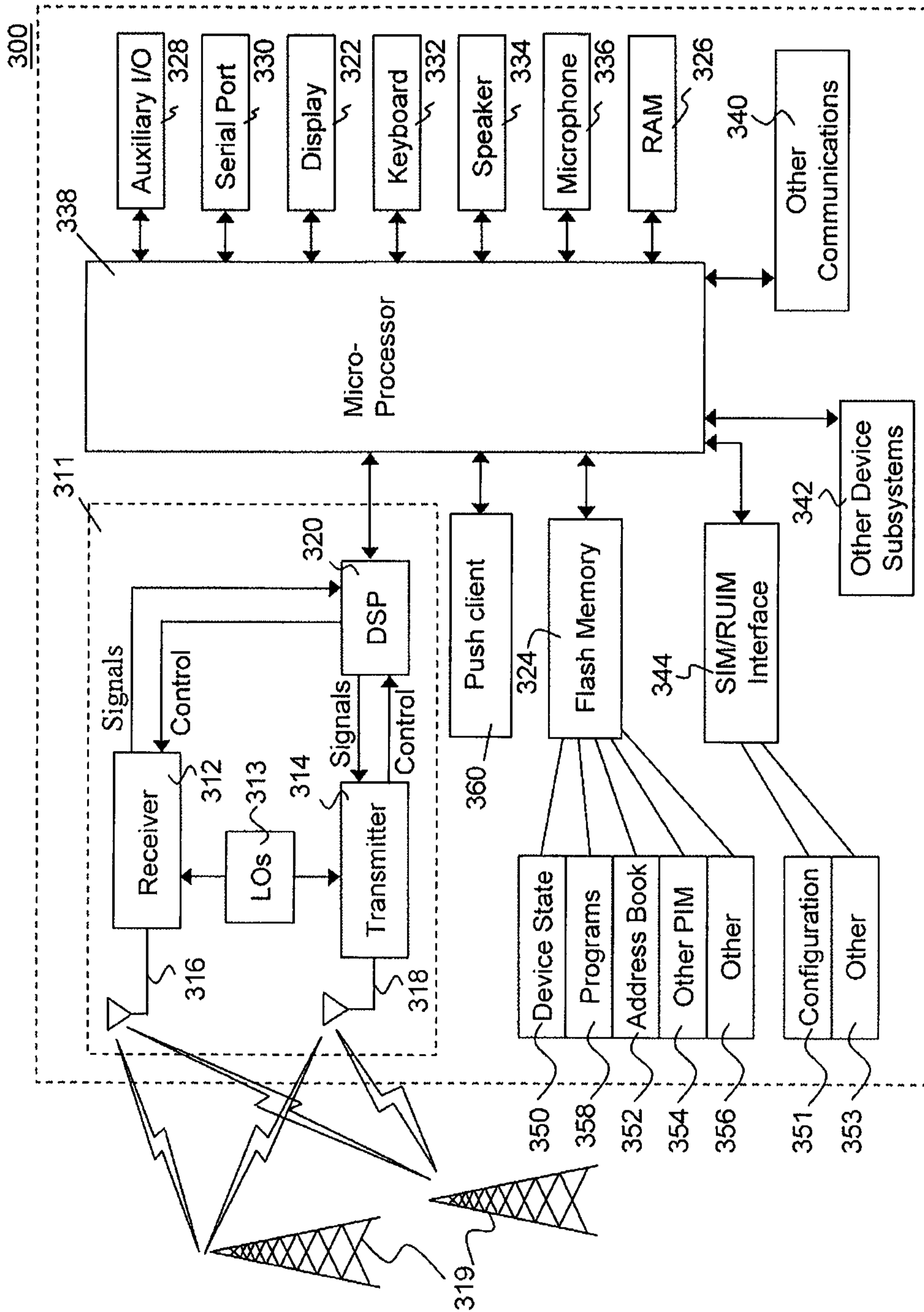


FIG. 3

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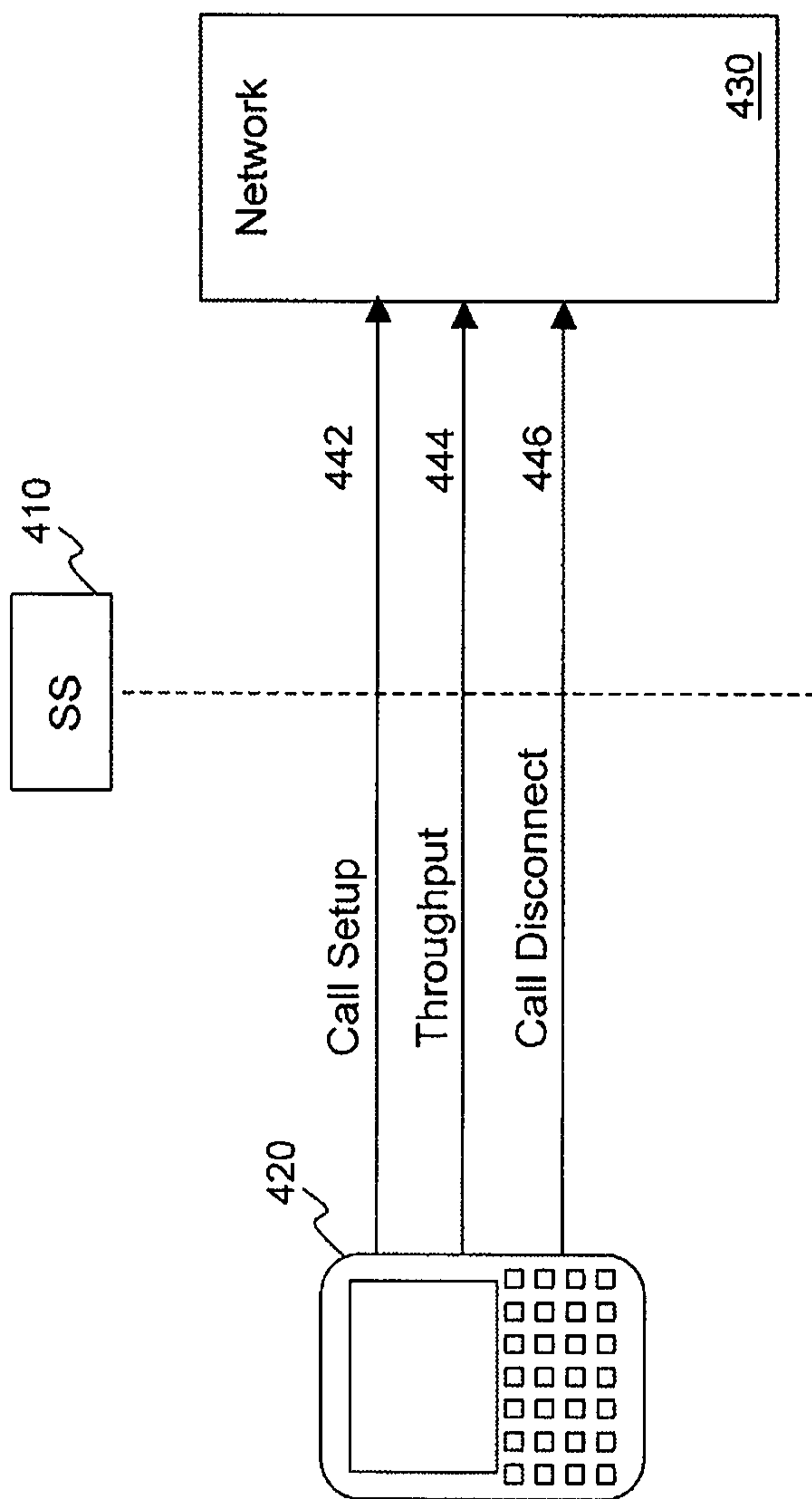


FIG. 4

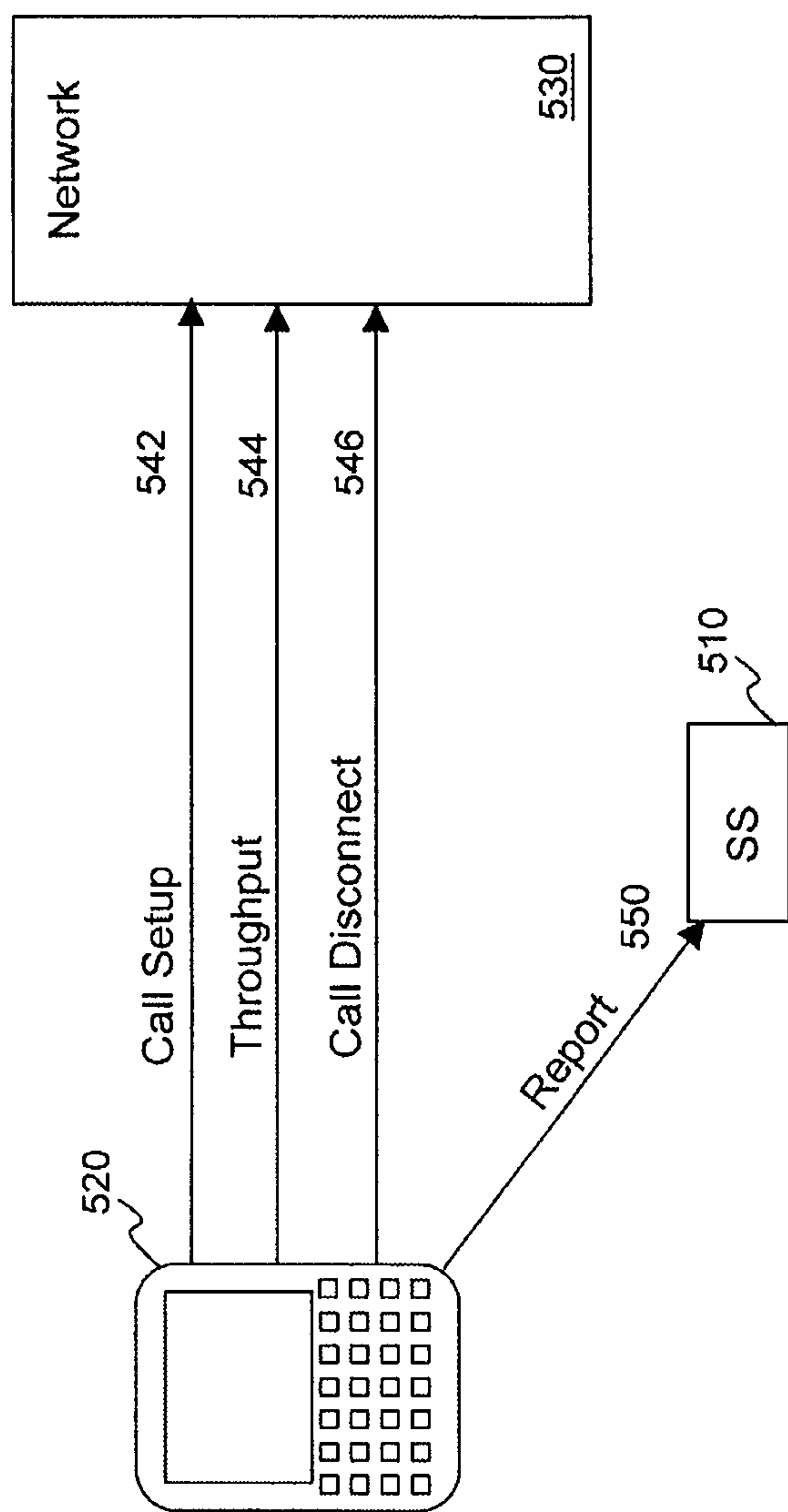


FIG. 5

